PUBLIC ACCEPTANCE

This is how we see transmission lines in the future. I'll come back to this in about ten minutes.

In the mean time I will tell you about our experience in getting acceptance of our designs from TSO's and the public.

TRANSMISSION LINES

Erik Bystrup
Chairman

Henrik Skouboe
CEO

BYSTRUP

ARCHITECTURE
DESIGN
ENGINEERING

Who we are and what we do.
We are a relatively small office designing transmission lines, which means both the towers and the integration of new lines in the landscape. This part is just as essential.
Due to the limited time I will concentrate on the tower design.

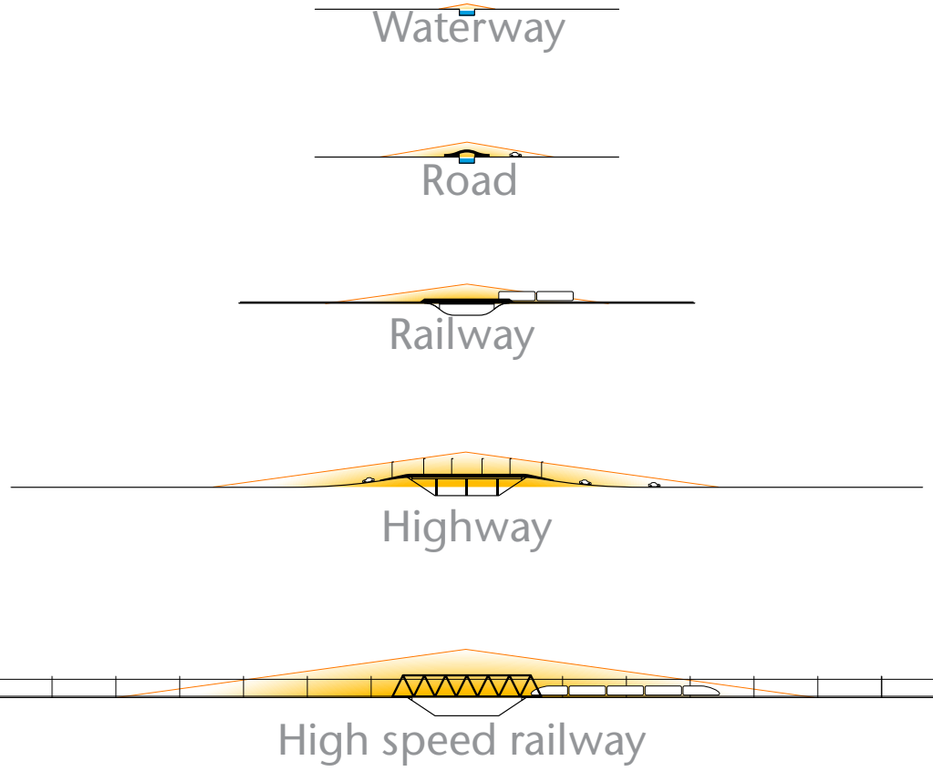
PUBLIC PERCEPTION OF LATTICE TOWERS

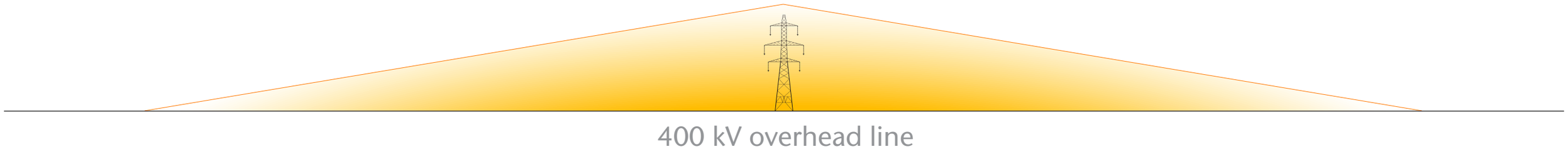
- Associated With Fossil Fuels
- Very Low Acceptance

Let me briefly present the situation today.
Very few people like the lattice tower. The structure is associated with fossil fuels and a threatening appearance.

Some time ago we arrived very late in the middle of England and had to get up very early the next day to appear on BBC morning news. The inn keeper said: I will tell you what I think of lattice towers. They look like grumpy old men.....

VISUAL IMPACT OF INFRASTRUCTURES





The transmission line is by far the most visible infrastructure element in the landscape.

The height of 50-60 metres out-measures most trees making it visible over long distances - 2, 3, 4, 5 kilometres.

NEW APPROACH

- Design Based On Responsibility - New Technologies & Aesthetics

2001

Design Pylon

2006

Eagle Pylon

2011

T-Pylon

2015

Composite Pylon

BYSTRUP

Now I will take you on a quick tour of the transmission lines we have developed over the years.

Starting with a single circuit to the left and ending with the line we are working on right now.

GETTING PERMISSION

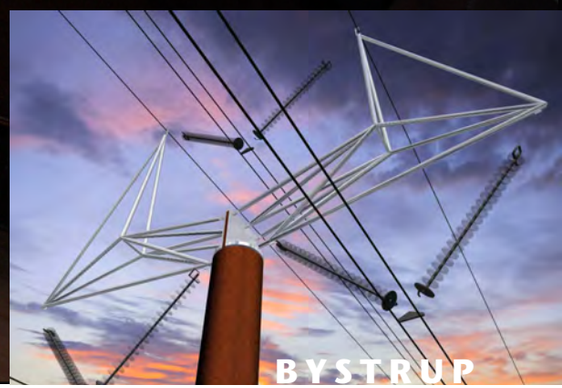
- Untouched Land

Denmark
1x400 kV
1st. prize in an international competition
Client: Energinet.dk

The first line we designed crossed previously untouched land. A relatively short line of 30 kilometres faced massive resistance from the public. Because of this, an international competition was organized by the Danish Government.

The winning entry is what you see here. The concept is based on a combination of poles that stroll through the landscape (like telephone poles) and a lattice structure of stainless steel tubes.

MEETING THE STAKEHOLDERS



This concept was presented to the stakeholders. Here a friendly crowd is having a good time - at the END of the meeting. This was NOT the attitude when we arrived. We were met with total silence and the first part of the meeting was characterized by discussions about cancer-causing magnetic fields and other uncertainties. The situation changed slowly when we started explaining about the different appearances and materials, and that we wanted their views and comments - that they had a choice. In the beginning suspiciousness was predominant, but after a while a more constructive dialogue resulted in the galvanized version in the middle being chosen. On our way out, three ladies who had been very active throughout the meeting came to me and said: “Well, it wasn’t the worst solution we could have gotten”, which in their terms was sheer praise.

"The pylons have been very well received by the locals, who call them Magic Wands".

Henning Øbro,
Senior Project Manager,
Energinet.dk

BYSTRUP

This picture shows that the concept actually works.
The tower heads merge into the sky and they are called MAGIC WANDS by the locals.

SKY PYLON

A few years later the situation reoccurred.
The upgrading of a line to the Danish-German border caused severe resistance due to the proposed standard lattice structures - we were asked to design an alternative. The Sky Pylon was our proposal. Clad in stainless steel, it would reflect the environment and more or less dissolve its own mass. The media was very interested in the design. TV-crews visited our office, and Der Spiegel called it art, which we of course found very flattering. The TSO however, was not so fond of such a radical design and questioned the impact of the suns reflection on passing drivers.

EAGLE PYLON

- Prototypes

So we had to come up with a different design. A rig design.
Again you see two versions. One in Corten steel - with stainless steel arms, the other in galvanized steel.
The Corten/stainless steel pylon is the best choice because it is the most environmentally responsible.
Now I want you to think about what is happening underground - what does the foundation looks like?

FOUNDATION

- Environmentally Responsible

Lattice Tower

Monopole Pylon

BYSTRUP

To the left you see a lattice tower foundation. And to the right the foundation that we developed. The one to the left takes about a month to make. You have to move a lot of material and to bring a lot of heavy loads of concrete to the site.
The one to the right is a steel tube that is hammered into the ground in half a day.

ERECTING SPEED

- One team
- One Pylon
- One Day

Photo: Erik Egvad Petersen
BYSTRUP

Modern manufacturing processes in controlled environments and elements that can travel on the roads in few pieces, make it possible to erect a pylon a day.
Erecting a lattice structure takes a week.

THE EAGLE LINE

- Backbone Of The Danish Transmission Grid
- 600 Pylons
- Abundance Of Positive Feedback

T-PYLON

United Kingdom
2x400 kV
1st. prize in an international competition
Client: National Grid

T-PYLON

Chief Executive of National Grid Steve Holliday presents the T-Pylon to Prince Philip

Photo: National Grid

BYSTRUP

The winning entry was on the front pages of English newspapers as well as in the BBC news.

The national coverage of the project placed it in the public eye and attracted high profile interest, such as that of Prince Philip.

PROTOTYPES

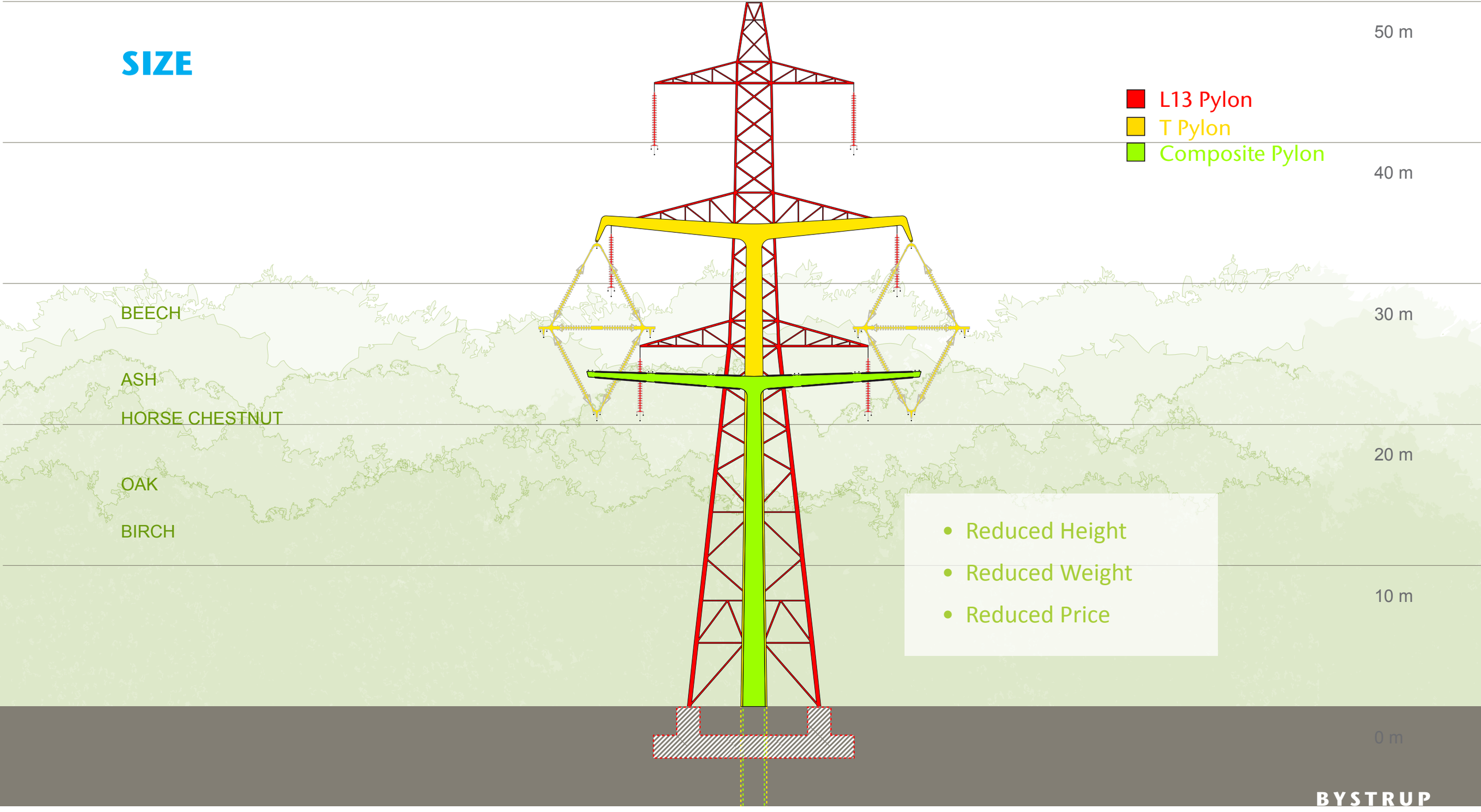
“To see T-Pylon becoming a reality just 20 months after winning the competition, is a fantastic achievement”.

Edward Davey
Secretary of State for Energy and Climate Change

Watch the film

BYSTRUP

Dynamic and static testing of the prototypes took place in June this year. The testing was succesful, and the T-Pylon is now ready for use. Throughout this development process National Grid kept a blog which publicly documented the projects progress, and recently, a film about the development process addressed to the public has been launched on National Grid’s website.



Now, getting back to the size of Pylons. This diagram shows the height of a standard lattice tower and the average height of trees in our landscape.

The red is a standard lattice tower. The yellow is the T-Pylon. But of greatest interest is the green one, which we are currently working on. You can see that it is significantly lower. Half the height, in fact.

CONVENTIONAL LINE

- Two Lines Each Carrying One 400 kV Circuit

I will try to show you what half the height means visually. Here you see a very normal situation. Two adjacent lines built next to each other, the second 15 years later, due to the increased demand for energy.

COMPACT LINE

- One Pylon Carrying Two 400 kV Circuits

This alternative carries the same amount of energy, but is significantly smaller.

RESPONSIBLE DESIGN

Here you see the two lines superimposed and it is obvious that the composite pylon uses significantly less space.

PUBLIC ACCEPTANCE FORMULA

Transmission Lines have to be **Low**, **Lean** & **Likeable**

Returning to the first slide, I would like to say: If you want the public to accept new lines, you have to make them low, lean and likeable.

Low: Take care of our common space
Lean: Use materials and processes that are environmentally responsible
Likeable: Design the elements so people can identify with them.